

## CROSS SECTIONS OF THE PROTON INDUCED NUCLEAR REACTIONS ON IRIDIUM

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Excitation functions of proton induced nuclear reactions on iridium were measured for practical applications up to 70 MeV. No earlier experimental data were found in the literature. The work was performed in the frame of a systematic study of excitation functions of light charged particle induced nuclear reactions on metal targets in the medium energy range. The cross-sections on iridium have been measured by using a standard stacked foil irradiation method. The irradiations were carried out with low intensity external beams of the cyclotrons at the Tohoku University, Sendai and of Vrije Universiteit Brussel. Al and Cu foils were inserted into the stack as energy degraders and to monitor the beam parameters. The  $\alpha$ -spectra of the irradiated iridium and monitor foils were assessed non-destructively on a High purity Ge detector. Counting was started a few hours after EOB and continued for several weeks. This allows following the decay of isomers and parent radionuclides and decomposition of gamma-lines originating from different isotopes. The beam intensity and the energy degradation along the stack were controlled via the  $^{nat}\text{Cu}(p,x)^{56,58}\text{Co}$ ,  $^{62,65}\text{Zn}$  and  $^{nat}\text{Al}(p,x)^{22,24}\text{Na}$  monitor reactions. So called elemental cross-sections were calculated by supposing the target to be monoisotopic. Direct and cumulative cross-sections were deduced from the parameters of the bombarding beam and of the target taking into account the decay data of the radionuclides involved. As a result the cross-sections of the  $^{nat}\text{Ir}(p,xn)^{188,189,191}\text{Pt}$  and  $^{nat}\text{Ir}(p,x)^{186,187,188,189,190,192}\text{Ir}$  nuclear reactions up to 70 MeV are presented for the first time. The measured experimental data were compared and analyzed with theoretical calculations based on the model code Alice-IPPE. The physical yields for production of different Pt and Ir radioisotopes were calculated from the experimentally measured excitation functions and the stopping powers for pure Ir metal. Application of the measured experimental data in the practice will be discussed.